

The Nexus of CRT Glass Management and the CEW Recycling Payment System

Background:

Soon after the enactment of the Electronic Waste Recycling Act of 2003 (Act) via the passage of SB 20, what was then the California Integrated Waste Management Board (CIWMB) proposed draft regulations to implement the covered electronic waste (CEW) recovery and recycling payment system. The proposed regulations tied the payment for recycling CEW that contained cathode ray tubes (CRTs) to the shipping of derived CRT glass. In fact, the proposed regulations based the payment on the weight of the shipped glass multiplied by a payment rate factor that depended on the degree of residual glass processing.

SB 50 amended the Act in 2004, prior to the promulgation of the original proposed regulations, and required the CIWMB to pay on the full weight of CEW recovered and processed (see PRC 42478(b)), thus establishing a clear distinction between CEW and CRT glass residuals. However, regulations continued to condition submittal of recycling payment claims on the shipment of residual glass and, in part due to an early market disruption involving a major lead smelter, were amended to clarify that all CRT glass derived from the processing (cancellation) of CEW must be shipped prior to submitting a payment claim for the cancellation of that CEW.

Program Experience:

Universal waste management rules applicable to CRT glass handling and treatment have generally recognized new CRT manufacturing (“glass-to-glass”) and lead smelting as the appropriate recycling dispositions for CRT glass. However, neither of these ultimate end-uses occurs within the state of California. Early program participants generally shipped glass to North American smelters or to glass processors for beneficiation prior to shipment to overseas CRT manufacturers. As more volume of CEW was recovered and processed, a larger proportion of derived CRT glass was ostensibly sent toward the “glass-to-glass” market. This practice was dictated by accessibility and price.

In the 4th quarter of 2009, access to Mexican CRT glass processors was interrupted. Because CEW recyclers were required to ship CRT glass to a destination “authorized to receive and further treat” the glass, this interruption caused the volume of claimed CEW to reduce dramatically while recyclers searched for appropriate alternative outlets for CRT glass. A couple recyclers pursued establishing their own in-state CRT processing capabilities, while other enterprises started or offered capacities out-of-state.

The requirement to “ship” CRT glass had been interpreted by CIWMB (now CalRecycle) as meaning that the glass be moved offsite from the facility where the CEW was cancelled. However, as access to ultimate disposition became more uncertain, and as the price charged by out-of-state processors increased, more recyclers expressed interest in establishing their own processing capabilities and sought off-site locations to fulfill shipping criteria. While this would allow CEW recycling payment claims to be submitted with regularity, it did not necessarily create new markets for CRT glass.

Current Situation:

CalRecycle understands that the current market for CRT glass is limited. Access to traditional lead smelting is reportedly difficult. Furthermore, traditional smelting does not recover lead from CRT glass effectively and results in hazardous slag wastes that must be subsequently managed. While there remain two known CRT manufacturers located in India available to receive glass from the West, reliable access and the longevity of those markets is uncertain.

Recent CRT glass management practices associated with the CEW recycling system include:

- A major glass processor in Mexicali continues to accept CRT glass and has received approximately 40 million pounds over the past two years from California CEW recyclers.
- Approximately 40 million pounds of CRT glass has been shipped by California CEW recyclers to a single operation in Arizona over the last two years.
- Another glass processor who closed its Arizona facility and consolidated operations in Ohio has received approximately 40 million pounds of CRT glass from California CEW recyclers over the last two years.
- Approximately 70 million pounds of CRT glass were shipped to in-state processors affiliated with CEW recyclers over the past two years.

Looking Ahead:

CRT glass can be categorized into leaded glass and non-leaded glass. Sometimes this is referred to as “funnel glass” and “panel glass”, but such classification is misleading since a portion of panel glass also contains lead. And even non-leaded glass likely contains other metals, such as barium, at levels that create environmental or regulatory concern. The ability to effectively identify, separate, characterize, and process CRT glass will be critical to future management options.

Reportedly there are new lead extraction technologies emerging that are more efficient than traditional smelting. Also, reportedly, there are alternative applications for CRT glass, such as in building materials, aggregate, proppant, and fill; however CalRecycle is not aware of any currently sanctioned production-scale applications such as these in the United States.

As the CEW recycling system moves forward, consideration must be given to the availability of viable CRT glass markets and alternatives, the anticipated duration of those markets, and the environmental impacts associated with moving the glass to those markets versus other management options.